Introduction:

The Radiologic Health Branch (RHB) staff collected soil samples from cores taken at the Former Sodium Disposal Facility (FSDF). The FSDF is located in Area IV of the Santa Susana Field Laboratory, South of Simi Valley, California. The upper pond and the western area of the FSDF are the two areas of concern for this survey. The purpose for the sampling is to determine if the two areas may be reclaimed without further radiological restrictions on the soil removal operations. The quantity of radioactive material found by the Sanitation and Radiation Laboratory (SRL) analysis is at or below levels found in background samples for the site.

Reference Documents:

1. N001TI000343; "Radiological Surveys & Release Criteria for Sodium Disposal Facility Excavation and Sorting Operations"; Energy Technology Engineering Center; R. J. Tuttle; March 13, 1992.
2. 886-ZB-0066; "Final Radiological Sampling & Gamma Survey Procedures to follow site Remediation of the Former T886 Sodium Disposal Facility."; Energy Technology Engineering Center, J. J. Collins; July 20, 1993.
3. 886-ZR-0007; "Post-Remediation Ambient Gamma Radiological Survey of the Former Sodium Disposal Facility (T886)"; Energy Technology Engineering Center; F. C. Dahl; December 13, 1994.
4. 886-ZR-0009; "Post-Remediation Soil Sampling and Analysis for the Former Sodium Disposal Facility"; Energy Technology Engineering Center; R. J. Tuttle; March 25, 1996.

Survey Personnel;

Roger Lupo

Survey Instruments:

1. Ludlum Model 19 s/n 80435 cal due date 5/21/98
2. Ludlum Model 3 s/n 134076 w/ 1x1 NaI s/n PR137133 cal due date 11/11/97

Survey Background Measurement:

Model 19	15μR/hr
Model 3	2500 counts per minute

Survey Report:

Core sampling of the Former Sodium Disposal Facility (FSDF) of Rocketdyne, located South of Simi Valley, Ca. began at 10:30 a.m. on September 16, 1997. The areas of concern are the upper pond and the western area of the FSDF.

Nine locations were identified for sampling. The methodology for the sampling was to take samples at the 3-ft, 5-ft, 7-ft, and bedrock (B) elevations to get a profile of the FSDF. The following is a list of the sampling locations and the depths of the samples taken. The coding for the Sample ID: is RBkFnFw-D; where R => Region, Bk => Block, Fn => Feet north of the southeast corner of the block, Fw => Feet west of the southeast corner of the block and D => the depth of the sample, relative to the sample location ground level. The survey proceeded with sampling at the desired elevations in each location until the drill hit bedrock and the last sample for that hole is collected.

Sample Identification List

1033825-3	2022525-B	2172525-3	2062525-7	2144343-B
1033825-B	2092028-3	2172525-5	2062525-B	2182525-3
2022525-3	2092028-5	2172525-B	219125-3	2182525-B
2022525-5	2092028-B	2062525-3	219125-B	2130707-3
2022525-6.5	2172525-105	2062525-5	2144323-3	2130707-B

The drill rig used a hollow quill with three six-inch brass shelves to obtain the designated sample. The middle sleeve contained the sample at the approximate specified depth. The bedrock sample was from the tip of the sample collection punch. Each sample was labeled and field measurements taken; an exposure reading using a Ludlum model 19 micro R meter and a gamma count using a Ludlum model 3 with a 1x1 NaI probe. The field data are listed in Table 1 and the locations are shown in Figure 1. All of the sample survey measurements were at or below survey background levels.

Table 1: Field Data

R number	Sample Id	µR/hr	cpm
74701	1033825-3	15	2500
	1033825-B	15	2500
74702	2022525-3	15	2500
	2022525-5	15	2500
	2022525-6.5	15	2500
	2022525-B	15	2500
74703	2092028-3	15	2500
	2092028-5	15	2500
	2092028-B	15	2500
74704	2172525-1.5	15	2500
	2172525-3	15	2500
	2172525-5	15	2500
	2172525-B	15	2500
74705	2062525-3	15	2500
	2062525-5	15	2500
	2062525-7	15	2500
	2062525-B	15	2500
74706	2192125-3	15	2500
	2192125-B	15	2500
74707	2144343-3	15	2500
	2144343-B	15	2500
74708	2182525-3	15	2500
	2182525-B	15	2500
74709	2130707-3	15	2500
	2130707-B	15	2500

R-number – sample analysis request number

All of the soil samples were sent to the Sanitation and Radiation Laboratory (SRL) in Berkeley, California for analysis. The SRL will analyze for gross alpha, gross beta, total uranium, isotopic uranium, strontium 89/strontium90 isotopic plutonium and a scan for the gamma spectrum of the sample. The laboratory results are listed in the following Tables 2, 3 and 4.

The results of the SRL analysis show the samples to have activities within the range of background samples. For comparison the following table 'Approximate Background Activity in Soil' is included in this report.

Approximate Background Activity in Soil

Isotope	pCi/g
Pu-238*	<0.0015 to 0.05 ± 0.05 (dry)
Pu-239*	0.0051 ± 0.0012 to 0.06 ± 0.06 (dry)
Sr-90*	0.01 ± 0.01 to 0.1 ± 0.04 (or<0.7) (dry)
Th-232**	1.0
U-238**	1.8

**Multi-Media Sampling Report for the Brandeis-Bardin Institute & Santa Monica Mountain Conservancy, March 10, 1993*

***NCRP#94 Table 4.3-Summary of concentrations of major radionuclides in major rock types and soil, page 61*

To conclude, the Upper Pond and the western area of the FSDF may be released for unrestricted use.

Table 2: Sample Analysis from SRL Gamma Spectrum Analysis

Sample Info		Gamma Analysis (pCi/g)													
R number	Sample Id	K-40		Cs-137		U-238		Ra-226		Th-232		Th-228		Ra-228	
74701	1033825-3	21.83	0.89	N.D.		0.97	1.79	0.898	0.84	1.658	0.172	1.38	0.0144	1.658	0.172
	1033825-B	22.09	0.7	N.D.		1.14	1.25	0.856	0.064	1.281	0.124	1.097	0.096	1.281	0.124
74702	2022525-3	21.83	0.89	0.047	0.028	1.3	0.95	0.992	0.08	1.462	0.167	1.214	0.122	1.462	0.167
	2022525-5	20.7	0.69	0.025	0.018	1.07	1.21	0.891	0.067	1.33	0.116	1.117	0.098	1.333	0.116
	2022525-6.5	20.43	0.68	0.014	0.015	0.85	1.31	0.829	0.06	1.338	0.125	1.13	0.099	1.338	0.125
	2022525-B	23.95	2.25	N.D.		0.8	1.22	0.495	0.216	1.251	0.384	1.032	0.294	1.251	0.384
74703	2092028-3	22.46	0.87	0.04	0.024	1.27	0.86	0.906	0.081	1.413	0.158	1.195	0.111	1.413	0.158
	2092028-5	18.28	0.66	N.D.		1.37	1.48	0.842	0.064	1.42	0.133	1.19	0.102	1.42	0.133
	2092028-B	21.64	0.91	N.D.		1.1	1.9	0.71	0.085	1.153	0.172	0.968	0.123	1.153	0.172
74704	2172525-1.5	23.12	0.94	0.017	0.025	0.92	0.91	0.82	0.077	1.377	0.185	1.16	0.119	1.377	0.185
	2172525-3	20.17	0.88	N.D.		1.37	0.92	0.825	0.078	1.267	0.157	1.065	0.106	1.267	0.157
	2172525-5	23.07	0.72	N.D.		1.42	1.43	0.81	0.066	1.292	0.144	1.132	0.101	1.292	0.144
	2172525-B	27.95	1.61	N.D.		1.06	1.55	0.782	0.132	1.441	0.219	1.232	0.196	1.441	0.219
74705	2062525-3	16.18	0.84	N.D.		0.76	0.89	0.681	0.084	1.314	0.152	1.092	0.121	1.314	0.152
	2062525-5	18.38	0.69	0.091	0.022	0.76	1.25	0.709	0.064	1.315	0.143	1.122	0.104	1.315	0.143
	2062525-7	14.43	0.78	0.019	0.018	0.56	0.82	0.653	0.074	1.063	0.137	0.921	0.114	1.063	0.137
	2062525-B	28.72	1.68	N.D.		1.27	1.72	1.063	0.153	2.072	0.274	1.7	0.228	2.072	0.274
74706	2192125-3	18.16	0.67	N.D.		0.98	1.59	0.791	0.064	1.347	0.114	1.181	0.101	1.347	0.114
	2192125-B	23.17	1.18	N.D.		1.21	1.07	0.741	0.096	1.347	0.191	1.163	0.147	1.347	0.191
74707	2144343-3	20.38	0.7	0.266	0.028	1.51	1.53	0.848	0.068	1.487	0.138	1.258	0.108	1.487	0.138
	2144343-B	22.42	1.14	N.D.		1.44	1.19	0.869	0.097	1.466	0.189	1.122	0.144	1.466	0.189
74708	2182525-3	20.67	0.76	N.D.		1.13	1.66	0.886	0.073	1.361	0.144	1.152	0.108	1.361	0.144
	2182525-B	27.49	1.52	N.D.		1.34	1.53	1.03	0.15	1.582	0.256	1.365	0.201	1.582	0.256
74709	2130707-3	18.99	0.69	N.D.		N.D.		0.815	0.067	1.456	0.137	1.226	0.096	1.456	0.137
	2130707-B	22.94	0.89	N.D.		1.15	1.99	0.906	0.085	1.638	0.177	1.364	0.127	1.638	0.177

Table 3: Sample Analysis from SRL Gross Alpha and Gross Beta

Sample Info		Gross Alpha		Gross Beta	
R number	Sample Id	pCi/g		pCi/g	
74701	1033825-3	19	2.1	23.2	1.6
	1033825-B	17.7	2	27.2	1.7
74702	2022525-3	15.9	1.9	26	1.7
	2022525-5	14.7	1.9	24.6	1.6
	2022525-6.5	16.1	2.2	25.1	1.7
	2022525-B	26.1	2.6	27.8	1.8
74703	2092028-3	17.6	2.3	27.1	1.7
	2092028-5	16.1	2	24.4	1.6
	2092028-B	14.1	1.8	22.5	1.5
74704	2172525-1.5	18	2	26.1	1.7
	2172525-3	25.9	2.4	29.2	1.8
	2172525-5	13.4	1.8	28	1.7
	2172525-B	13.4	1.8	23	1.6
74705	2062525-3	10	1.6	19	1.3
	2062525-5	13.8	1.8	22.4	1.5
	2062525-7	15	1.9	18.3	1.4
	2062525-B	24	2.5	27.3	1.7
74706	2192125-3	20.1	2.1	22.5	1.6
	2192125-B	18.9	2.3	27.4	1.7
74707	2144343-3	23.8	2.5	28.1	1.8
	2144343-B	19.6	2.2	25.4	1.6
74708	2182525-3	23.5	2.4	24.5	1.7
	2182525-B	20.1	2.2	24.2	1.6
74709	2130707-3	20.8	2.2	24.9	1.7
	2130707-B	23.6	2.4	27	1.7

Table 4: Sample Analysis from SRL Isotopic Analysis

Sample Info		Isotopic Analysis (pCi/g)													
R number	Sample Id	U-238		U-234		U-235		Pu-238		Pu-239/240		Sr-89		Sr-90	
74701	1033825-3	0.811	0.091	0.784	0.089	0.033	0.016	0.002	0.002	N.D.		N.D.		N.D.	
	1033825-B	0.76	0.084	0.768	0.085	0.035	0.016	0.01	0.005	N.D.		N.D.		0.071	0.037
74702	2022525-3	0.716	0.088	0.608	0.08	0.025	0.015	N.D.		0.004	0.003	N.D.		0.083	0.05
	2022525-5	0.739	0.069	0.703	0.067	0.029	0.014	0.012	0.003	N.D.		N.D.		N.D.	
	2022525-6.5	0.74	0.067	0.652	0.062	0.023	0.012	N.D.		N.D.		N.D.		N.D.	
	2022525-B	0.774	0.063	0.684	0.057	0.041	0.011	0.016	0.006	0.018	0.007	N.D.		N.D.	
74703	2092028-3	0.9	0.083	0.825	0.078	0.04	0.018	0.005	0.004	N.D.		N.D.		N.D.	
	2092028-5	0.91	0.073	0.882	0.071	0.028	0.009	0.005	0.003	N.D.		N.D.		N.D.	
	2092028-B	0.631	0.108	0.598	0.105	0.044	0.028	0.002	0.002	N.D.		N.D.		N.D.	
74704	2172525-1.5	0.62	0.054	0.623	0.054	0.03	0.016	0.002	0.002	0.002	0.002	N.D.		N.D.	
	2172525-3	0.735	0.06	0.747	0.06	0.039	0.01	N.D.		N.D.		N.D.		N.D.	
	2172525-5	0.8	0.066	0.752	0.062	0.036	0.01	N.D.		N.D.		N.D.		N.D.	
	2172525-B	0.54	0.046	0.488	0.043	0.028	0.008	0.006	0.004	N.D.		N.D.		N.D.	
74705	2062525-3	0.679	0.065	0.671	0.064	0.033	0.012	0.003	0.003	N.D.		N.D.		N.D.	
	2062525-5	0.634	0.053	0.611	0.051	0.024	0.008	0.011	0.005	N.D.		N.D.		N.D.	
	2062525-7	0.613	0.064	0.612	0.064	0.014	0.008	0.006	0.003	N.D.		N.D.		N.D.	
	2062525-B	0.818	0.064	0.726	0.058	0.03	0.008	0.007	0.004	0.004	0.003	N.D.		N.D.	
74706	2192125-3	0.781	0.063	0.767	0.062	0.035	0.009	0.005	0.004	N.D.		N.D.		N.D.	
	2192125-B	0.687	0.057	0.645	0.054	0.04	0.011	N.D.		0.005	0.004	N.D.		N.D.	
74707	2144343-3	0.888	0.07	0.853	0.068	0.036	0.01	0.011	0.0005	N.D.		N.D.		N.D.	
	2144343-B	0.819	0.066	0.821	0.066	0.04	0.01	0.003	0.003	N.D.		N.D.		N.D.	
74708	2182525-3	0.825	0.066	0.763	0.062	0.047	0.012	0.004	0.003	0.002	0.002	N.D.		N.D.	
	2182525-B	0.642	0.055	0.595	0.052	0.022	0.008	0.007	0.005	N.D.		N.D.		N.D.	
74709	2130707-3	0.928	0.072	0.898	0.07	0.041	0.01	0.006	0.004	N.D.		N.D.		N.D.	
	2130707-B	0.809	0.066	0.753	0.062	0.032	0.009	0.025	0.008	0.023	0.008	N.D.		N.D.	

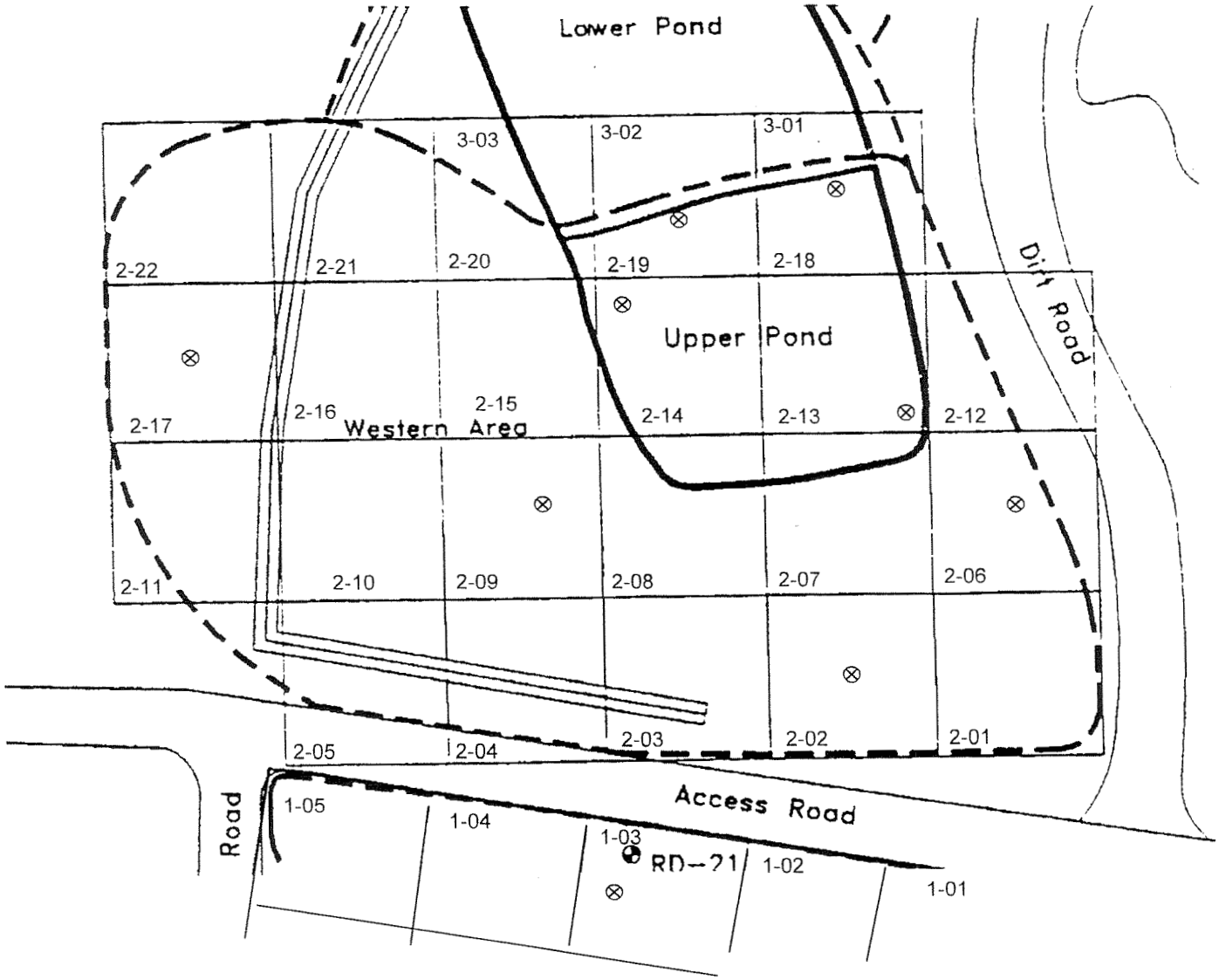

Figure 1
Former Sodium Disposal Facility T886
RHB Sampling Locations
Core sample to bedrock

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